United States Steel

USS – MIDWEST

DIW AND TRENCH REFURBISHMENT PROJECT

CIVIL SPECIFICATION #C100 – DIW 24-inch line replacement

CIVIL SPECIFICATION #C200 – Acid Trench Rehabilitation

DATE: 8/23/17 – For Bids

Rev. 0

Orbital Engineering Inc.

This cover packages the two individual Work Specifications as indicated.

Bidders shall provide the following for each specification:

- Pricing for work indicated.
- Bills of materials for the work
- Schedule for each of the work tasks
- Construction Plan description of work and sequence of the work
- Other pertinent information to the installation plan bid by the contractor.

a) Project Contacts:

B. CONTRACTOR REQUIREMENTS

1. The Contractor shall be responsible for the following:

a) Before start of field construction actives, attend a construction meeting at work site with the Owner's Representative.

b) Submit complete construction documents as outlined in the contract documents.

c) Any major errors found during field construction which would prevent proper assembly and fitting of parts and result from deviations from design drawings, correct rework, or design and drawing errors, shall be reported to the Owner. Contractor shall obtain the Owner's written approval for any deviations or corrective work.

Please see each of the two work descriptions included under this cover.

[End of this section]

United States Steel

USS – MIDWEST

DIRTY INDUSTRIAL WASTE DIW 24-Inch LINE REPLACEMENT PROJECT

PIPING SPECIFICATION

DATE: 8/23/17

Rev. 0

Orbital Engineering Inc.

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I. INSTALLATION/CONSTRUCTION

A. GENERAL

1. Scope

Purpose of this project is to replace the Pipe from manhole 20 to manhole 21. Vitrified Clay Pipe (VCP) is commonly used in gravity sewer collection mains because of its long life and resistance to almost all domestic and industrial sewage.

This will be accomplished by enlarging each manhole by installing a new manhole directly beside the refurbished the manholes. A new excavated area will need to be cut across the road. New 24" pipe installed in the new excavated area. The existing trench will need to have the pipes properly sealed with temporary bulkheads. The installation contractor may choose to modify the steps with the approval of and USS personnel.

a) The Proposed Installation Steps include the scope of work: Contractor shall propose alternate steps in bid if he states his proposed procedure:

1. Open up by excavation, the area around manhole 20 and north of manhole 21. Also, open up the entire length of pipe run between the two manholes. See Photo 1 through 3 and drawing 740-0061
2. Demolish 8" Pipe back and plug the 8" pipe. Pipe plugs shall be made utilizing non-shrink grout.
3. Prepare subgrade for manhole 20A.
4. Place 24" Pipe in excavation.

Start Outage

5. Saw cut square hole in manhole 20.
6. Prepare pipe stub piece
7. Install details around the pipe at the hole.
8. Grout-in the space between window and pipe.
9. Put water stop around 20A dog house windows.
10. Drop manhole 20A into place.
11. Grout floors and walls.

Concurrently at manhole 21

12. Demolish existing manhole 21.
13. Demolish 16' of existing acid trench. Dam trench to prevent migration. See drawing 740-0061
14. Cut back existing 24" pipe and plug.
15. Prepare pipe ends.
16. Prepare subgrade.
17. Install new manhole 21, grout walls and floors.
18. Place soil back into excavation.

2. Specifications, Standards and Codes The design shall be in compliance with federal, state, and local building codes, the owner's applicable specifications, and applicable industry standards from organizations such as AISC, ANSI, ASME, etc.

B. CONSTRUCTION REQUIREMENTS

1. The Contractor shall be responsible for the following:

a) Before start of field construction actives, attend a construction meeting at work site with the Owner's Representative.

b) Submit complete construction documents as outlined in the contract documents.

c) Any major errors caused during field construction which would prevent proper assembly and fitting of parts and result from deviations from design drawings, correct rework, or design and drawing errors, shall be reported to the Owner. Contractor shall obtain the Owner's written approval for any deviations or corrective work. Contractor shall notify Owner's Engineer before work proceeds.

C. INSPECTION & TESTING

TBD

Drawings:

1) 1761-C-001 Demolition
2) 1761-C-002 24-inch Pipe Installation Plans & Details
3) 1761-C-003 24-inch Pipe Details/Sections

United States Steel

USS – MIDWEST

ACID TRENCH REHABILITATION PROJECT

CIVIL SPECIFICATION #C200

DATE: 8/23/17

Rev. 0

Orbital Engineering Inc.

Table of Contents

I. INSTALLATION/CONSTRUCTION

A. GENERAL

1. Base Scope

a) Purpose of this project is to refurbish the acid trench that has failed. Work scope includes:

(1) Before work can begin, US Steel will have the trench hydro-blasted (and/or sand blasted) and vacuumed to remove any contamination or debris. Surface preparation is critical to epoxy coating installation

(2) Contractor shall include scope for final surface preparation following that prepared for him by USS's hydro-vac contractor.

(3) Contractor shall install replacement trench section which was cut-out for the 24-inch pipe replacement work (see that 17.5-ft section removed from Drawing 1761-C-001) Top of base of new trench section shall be aligned with the new top of concrete on the filled-section of the acid trench. Existing trench covers shall be used once the portion of the trench is replaced.

(4) For this scope, a base of concrete shall be laid in the pipe with thickness of average thickness of 12-inches for approximately the first half (south half) of the trench, and then approximately 4-inches for the second half of the trench run (north half).

(5) At least three locations require interior concrete barriers in the trench to be removed so that the trench can freely drain.

(6) At least six (6) locations require a 'bulkhead to be constructed as termination points of the containment of the acid trench. These bulkheads shall be constructed of concrete, reinforced with rebar both ways, and doweled into the existing floors and walls of the acid trench. The wall of this dam facing the containment trench shall also be epoxy coated. See design drawing details.

(7) Epoxy Coating shall be installed. A multi-layer coating system shall be used. Each layer in the system shall have a distinctive color, as to alert USS to wear/degradation of the coating. Epoxy System shall be a two-component, solvent free epoxy resin system to provide a high-build coating that protects concrete from a wide range of aggressive chemicals including acid. Suitable system is BASF MasterProtect 1812 or approved equal. Alternate systems shown to be proven against acid attack will be considered if submitted as cost-saving alternate to that material specified.

(8) Epoxy coating shall be ensured to be cured per the manufacturer's recommendations. Conditions of moisture control and control of temperature for the cure time shall be ensured both for the exterior trench as well as the trench interior to the building.

(9) Carry water will be used to prevent pooling of trench contents. The Carry water will require field routing 1/2" carbon steel pipe from the nearest source to the trench. Work with USS to identify service water location for that tie-point.

(10) A valve shall be provided for manual on/off of the water flushing system.

2. Alternate Scopes

There are three additional areas of work scope that should be bid as separate line items in the bid documents.

1. OPTION #C200-A: The first, Epoxy coating Chrome Plater Sump (Sump #1). (Approx 8-FT wide X 11.75-FT long X 7.5-FT deep)
2. OPTION #C200-B: The second, to Epoxy coat the trench leading to the Chrome Plate Sump (Approx 4.5-FT wide X 166-FT long)
3. OPTION #C200-C: The third, to Epoxy coat the Tin Treatment Sump (Approximately 6.5-ft x 8-ft x 12-ft deep)

B. CONTRACTOR REQUIREMENTS

1. The Contractor shall be responsible for the following:

a) Before start of field construction actives, attend a construction meeting at work site with the Owner's Representative.

b) Submit complete construction documents as outlined in the contract documents.

c) Any major errors found during field construction which would prevent proper assembly and fitting of parts and result from deviations from design drawings, correct rework, or design and drawing errors, shall be reported to the Owner. Contractor shall obtain the Owner's written approval for any deviations or corrective work.

C. INSPECTION & TESTING

1. Inspectors

a) Owner's Inspector(s)

When Owner elects to provide its own Inspector(s), Suppler shall:

(1) Provide sufficient, safe, and proper facilities at all times for inspection of work, furnish full information concerning all material entering into work, and grant Owner's Inspector(s) free access at all reasonable times.

(2) Notify Engineer at start of liner installation, and reasonably in advance for prearranged testing or inspection.

b) Installer's Inspectors

Contractor's Field Inspectors shall verify that:

(1) All material arrived undamaged at receiving area. If damage has occurred, notify Owner's Engineer.

(2) Take concrete slump and flow density tests every 50 cubic yards of installed concrete mix, and at least once per day.

(3) The pour shall been cured properly.

2. Reports and Records

Maintain the following and submit only at the Owner's request:

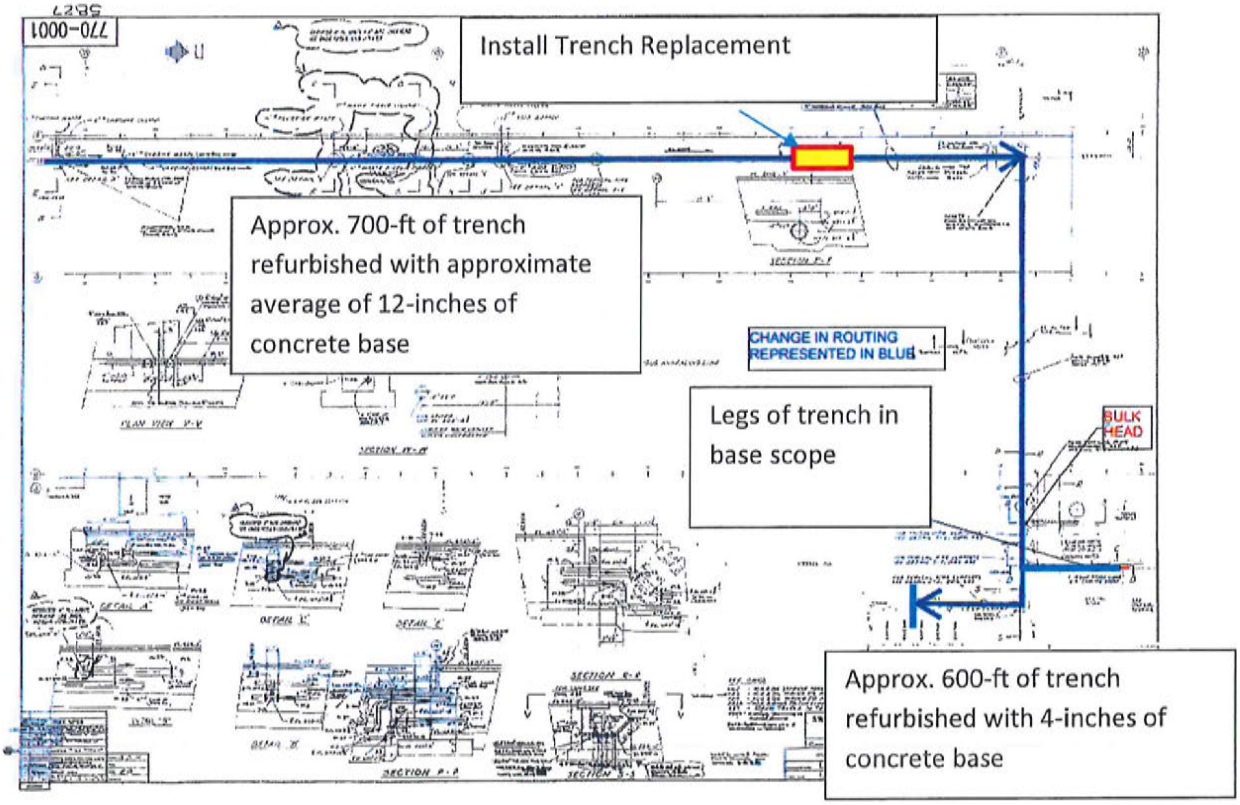
a) Provide all slump and density records.

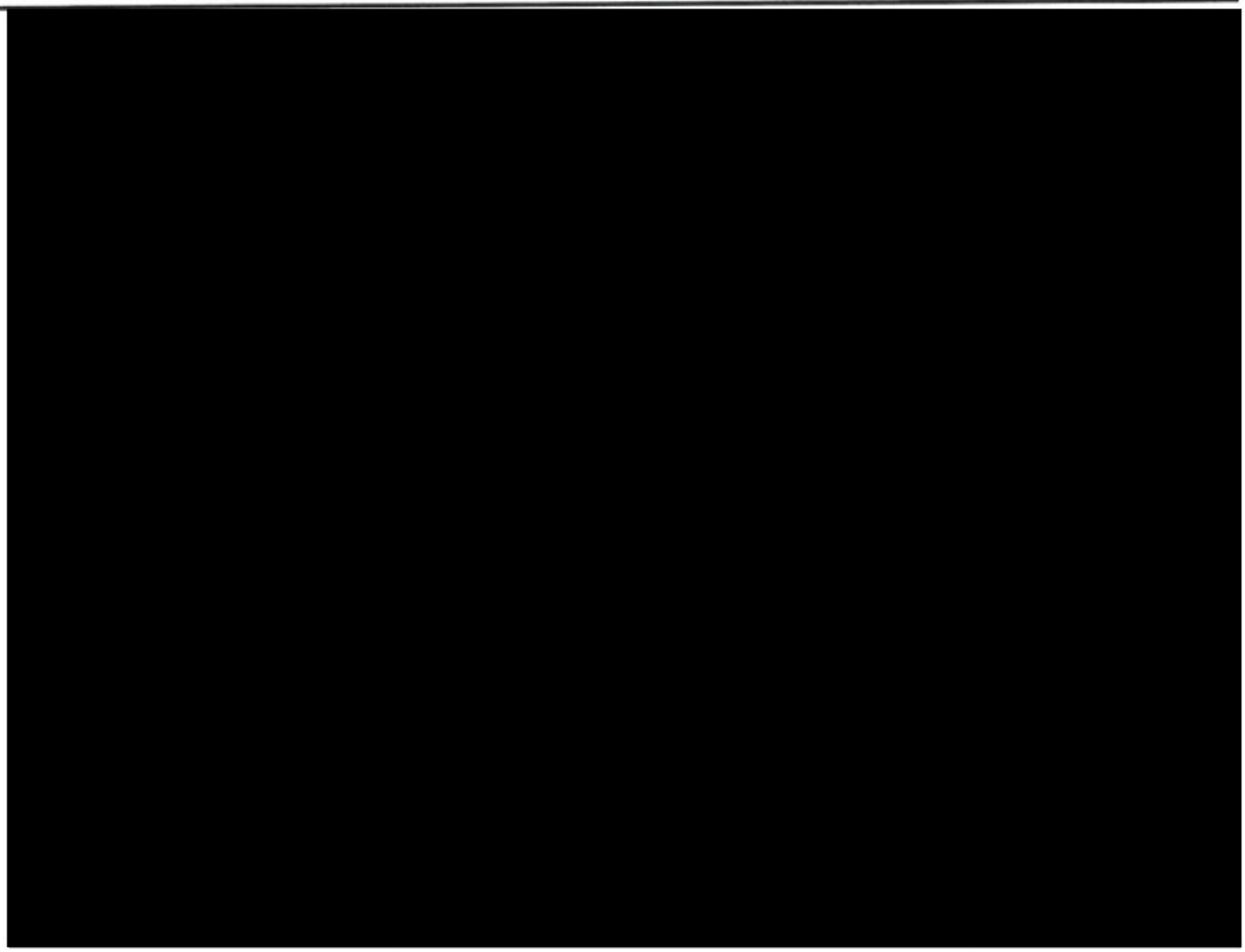
b) Record of cure procedure.

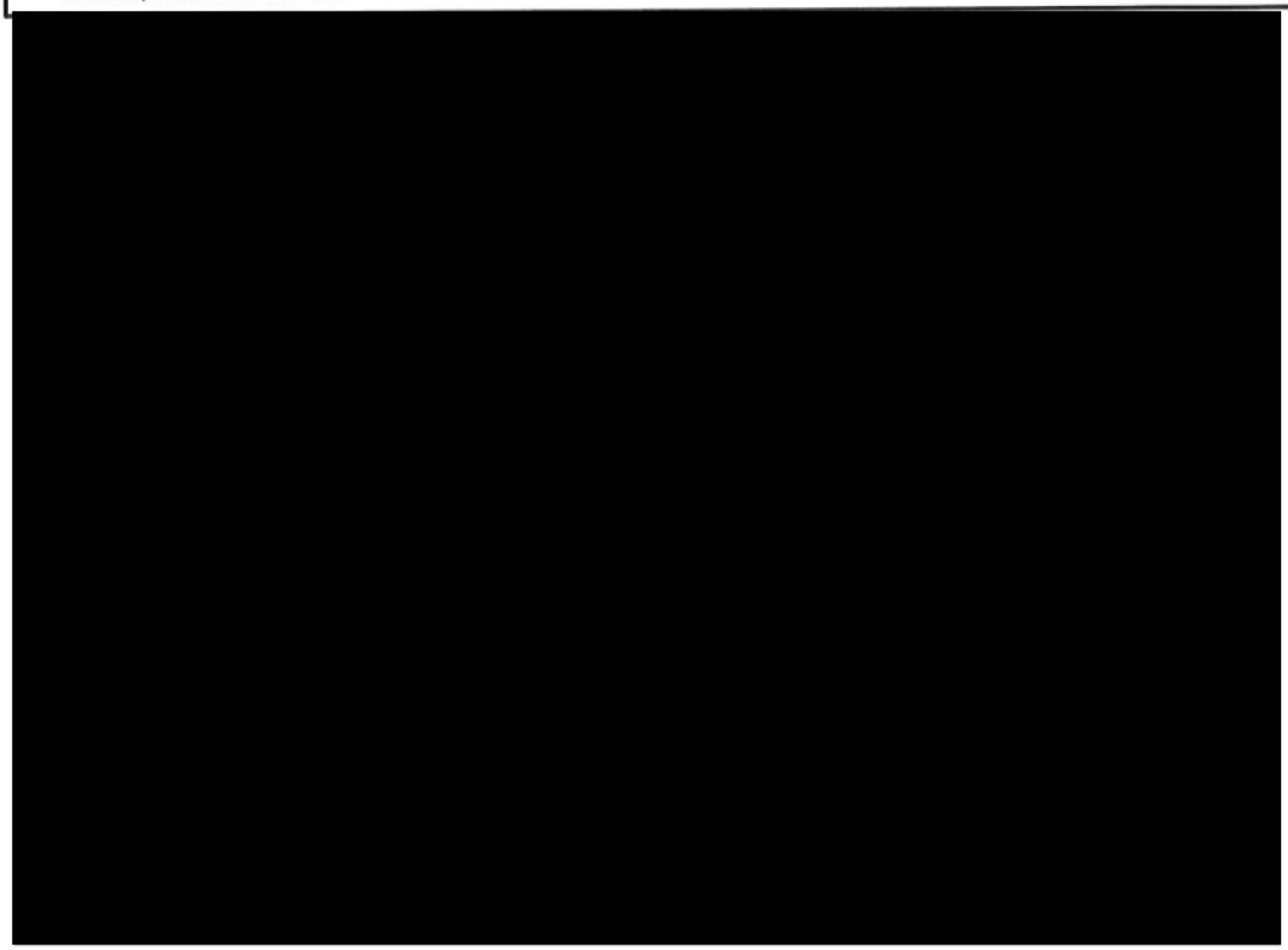
c) Redline as-built drawings.

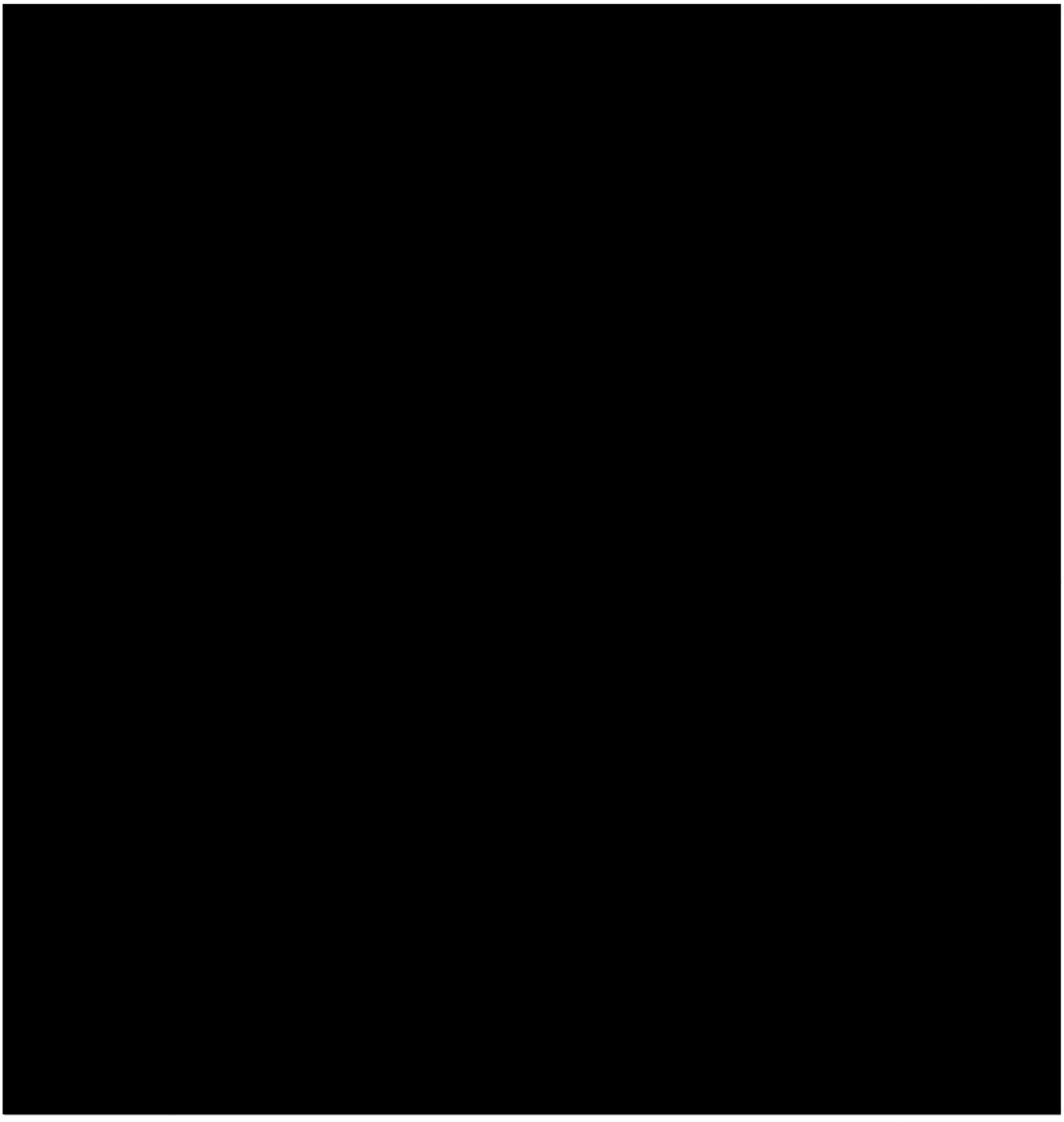
Drawings for Trench Rehabilitation:

1) See Attached.


Install Trench Replacement
Approx. 700-ft of trench refurbished with approximate average of 12-inches of concrete base
CHANGE IN ROUTING REPRESENTED IN BLUE
Legs of trench in base scope
BULK HEAD
Approx. 600-ft of trench refurbished with 4-inches of concrete base







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